

**METHOD FOR COMMUNICATION A REFERENCE NUMBER
OVER NON-SECURE NETWORKS**

FIELD OF THE INVENTION

0001. The present invention is related to communicating reference numbers over networks, in particular to a method for communicating purchase order related data over non-secure networks.

BACKGROUND OF THE INVENTION

0002. Making purchases over public networks is of ever-increasing importance. Merchandising over public networks like Internet comprises on-line shopping for goods or content. Although developments have been started for electronic payment concepts, the usage of credit cards is most common while placing an order via public computer-networks. Especially in cases where the merchant is not acquainted with the customer, which often is the case, credit card data should be exchanged between the customer and the merchant in order to fulfill the ordering process.

0003. One possible way to place an order is to send the ordering information and the credit card data from the customer to the merchant over the public network. The drawback of this method is the lack of security. The security on public networks is poor, or the security of the network is at least conceived by the customer as being poor. In general, the credit card data passes through many network nodes while being

transported from the customer to the merchant,
providing others the opportunity to unlawfully access
the credit card data.

5 0004. A possible way to overcome this problem,
known from United States Patent No. 5,727,163, is to
let the customer initiate the order over the public
computer-network entering the ordering information and
entering only a subset of the credit card number.
10 After having been received by the merchant's
facilities, this part of the credit card data is stored
in a storage means. The customer should then enter
during a subsequent phone call the complete credit card
number. The complete credit card number having been
15 received, the subset of this credit card number will be
compared with the different subsets stored in the
storage means. If a subset equals the corresponding
portion of the complete credit card number, then the
complete credit card number will replace that subset in
20 the storage means, so the order can be finalized.
However, this known method assumes a secure public
network to communicate the complete credit card number.
Thus, at least the conceived non-security of public
networks will not be taken away by this method,
25 resulting in possibly more reluctant customers. Also,
in case of a mobile public network this security issue
could be a real threat for secure communication of the
complete credit card number. Another drawback of the
method according to the prior art is the possible
30 occurrence of duplicate subsets of credit card numbers.
Two different customers may have equal subsets of their
credit card numbers, resulting in non-unique subsets in

the merchant's storage means. It will then not be possible to associate a complete credit card number with one single subset, and thus with one single purchase order. In such cases it will be necessary for a merchant's employee to interfere with the purchase process, or additional measures have to be taken to solve this problem.

AIM OF THE INVENTION

0005. It is an object of the invention to eliminate the drawbacks of the prior art and to provide a method for communicating a reference number over non-secure networks. A first object of the invention is to avoid communicating the entire reference number over a non-secure network, or a network conceived as non-secure. Additionally, another object of this invention is to provide a method for associating different purchased related information entities, each being communicated over a network.

SUMMARY OF THE INVENTION

0006. In accordance with an aspect of this invention, a method is defined for communicating a reference number over one or more networks between a customer location and a remote location, in particular to a method for communicating purchase order related data over non-secure networks. A reference number can be a credit card number or any other kind of identification related to a purchaser's account. In order to communicate all the information to fulfill the

purchase process between the customer location and the remote location two different connections, a first connection and a second connection, can be used.

5 0007. The method according to another aspect the present invention comprises the steps of:

- completing a purchase order form that includes purchaser data and a predefined subset of the reference number;
- 10 ▪ receiving purchaser data and the predefined subset of the reference number at the remote location from said customer location via said first connection;
- storing the purchaser data and the subset of the reference number in a storage means of a computer system at the remote location, said purchaser data being associated with the customer making the purchase;
- 15 ▪ receiving reference number related data via a second connection over a network from the customer location by an order-handling system, such as an IVR system at the remote location;
- 20 ▪ associating said second connection with the purchase order using the reference number related data, and the subset of the reference number transmitted via said first connection, resulting in the complete reference number corresponding to the purchase order;
- 25 ▪ receiving an identification code from the customer location at the remote location;
- 30 ▪ receiving at the remote location via said second connection reference number digits supplementary

to the digits in the subset of the reference number.

0008. The second connection can be associated with
5 the purchase order using an identification code, after
which the complete reference number is determined by
concatenating the digits in the subset of the
reference number, and the supplementary reference
number digits.

10

0009. According to an embodiment of the invention
this step of the method enables a reference number to
be communicated between a customer and a remote
merchant using two different connections. Each
15 connection can be established over a separate secure or
non-secure network, although it is also possible that
both connections are established over the same network.
So, this method takes away the disadvantage of the
prior art that a network, such as the public telephone
20 network, is assumed to be a secure network, or that
this network at least has to be regarded as secure by
the customer. The purchase data and the predefined
subset of the reference number having been received,
both types of data are stored in a storage means of the
25 merchant's computer system and associated with the
customer making the purchase.

00010. The method according to the invention can
further include the step to enable the usage of an
30 identification code by the customer, after having
completed a purchase order form. This identification
code is used by the customer to associate the second

connection with the purchase data and the predefined subset of the reference number stored in the storage means of the merchant's computer system. The identification code relates the supplementary digits of the reference number to the stored subset of the reference number. In a specific embodiment of the method according to the invention, the identification code is a unique code, solving the problem in the prior art that a reference number occasionally cannot be associated uniquely with one single purchase order. After the supplementary digits of the reference number have been received by an automated attendant system or IVR system, these digits will be concatenated with the stored subset of the reference number, resulting in the complete reference number.

BRIEF DESCRIPTION OF THE DRAWING FIGURE

00011. The foregoing aspects and many of attendant advantages of this invention will become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawing, wherein:

00012. FIG. 1 is a block diagram illustrating the components involved in the communication between a customer location and a remote merchant, over a network, when receiving an order charged according to a reference number.

EXEMPLARY EMBODIMENTS

5 00013. For the purpose of teaching of the invention,
preferred embodiments of the method and devices of the
invention are described in the sequel. It will be
apparent to the person skilled in the art that other
alternative and equivalent embodiments of the invention
can be conceived and reduced to practice without
departing from the true spirit of the invention, the
10 scope of the invention being limited only by the
appended claims.

15 00014. With reference to FIG. 1, the principal
components used to implement the present invention are
illustrated. At the top of FIG. 1, a dashed line
defines a customer location (9), which in many cases
will be the customer's home or place of business. The
customer uses a personal computer (11), or any other
20 type of terminal, for accessing information related to
goods, services or contents that can be purchased by
the customer. Peripheral devices like a modem and a
mouse are not shown. The personal computer (11) may
also be part of a local area network. At the customer
location (9) is also an access device (12) for
25 accessing a mobile or fixed network, such as a
telephone, a laptop or a personal computer. If the
access device (12) is a telephone, it preferably is a
touch-tone telephone, although a pulse-type telephone
also may be used with the present invention. An IP
30 telephone may be used in connection to the present
invention too. Wireless and mobile devices are also
taken into account with regard to this invention, such

as mobile phones and bluetooth supporting devices. In the case of the usage of a mobile device the customer location (9) is supposed to be the physical location where the customer is at the moment of making use of the devices. The personal computer (11) and the access device (12) may also be integrated within one device, such as an i-Mode handheld.

00015. The first connection (1) that provides the customer access to the remote location (10) may be established over a public network, such as the Internet, or over a private network. The network over which the first connection is established may be a non-secure network or a network that is perceived as being non-secure, although secure networks are not excluded in relation to this invention. In case of the first connection (1) being a secure connection over a non-secure network, the method according to this invention is still relevant since it may be too complex for the customer to configure and establish such a connection. The first connection (1) is facilitated by a service provider, such as an Internet service provider, although the first connection (1) can also be facilitated by an organization operating accessibility to remote sites for specific groups of customers. In the latter case the customer is able to access directly, i.e. without using the Internet, one or more remote locations. Furthermore, the first connection can be facilitated by a private network service provider. This is often, but not necessarily, the case when the personal computer (11) is part of a local area network.

00016. The physical connection between the personal computer (11) and the network over which the first connection (1) is established, can be through a modem and a telephone line, a networking device and a leased line, or any types of wireless connection means. The details of the type of connection between the personal computer (11) and the network are of no consequence in the present invention.

00017. If the network over which the first connection (1) is established is a public network, then it is in general not operated end-to-end by one single operator. Although this holds for the network on carrier network level, network domains are often managed and operated by one single operator. The Internet is an example of a network that provides the customer access to sites where goods, services and content can be ordered on-line, which is not operated end-to-end by one single operator. These types of sites reside at a physical location like the remote location (10) depicted in FIG 1. A computer system (6) at the remote location (10) is connected to the network over which the first connection (1) is established by means of one or more network devices, such as a router, and high-speed data connections. Usually, the computer system is protected against threats originating from a non-secure network by means of a fire-wall (not shown). Another entity at the remote location (10) is an order-handling system (7), such as an Interactive Voice Response system, which can be accessed via a second connection (13) over a network. The first connection (1) and the second connection (13) can be

established over different networks although this is not necessarily according to this invention, since both connections may be established over the same network.

5 00018. As discussed above in the background, customers are reluctant to use a public network, such as Internet, for making purchases and thus communicating reference numbers that are related to a purchaser's account over the Internet. Alternatively,
10 the customer is instructed to enter a predefined subset (3) of the reference number, such as the last n digits of the reference number. Next, the customer will then be completing the purchase order form that includes purchaser data (2) and the predefined
15 subset (3) of the reference number. The purchaser data (2) and the subset (3) of the reference number are then received by the remote location (10) from the customer location (9) via the first connection (1). At the remote location (10) the purchaser data (2) and the
20 subset (3) of the reference number are stored in a storage means (5) of the computer system (6). This data will then be associated with the customer making the purchase.

25 00019. The customer can be instructed to make use of a second connection (13), such as a telephone connection set up by dialing 0800- or another telephone number. Displaying on the screen the instruction including information about how to set up the second
30 connection (13) can accomplish this. The method according to the invention includes the step that the instruction can also include an identification code (8)

that can be used by the customer to make a reference to the purchase order. The identification code (8) can be provided by the computer system (6) to the customer by means of displaying the identification code (8) on the screen. Alternatively, the identification code (8) can also be provided by the personal computer (11) to the computer system (6). In this latter case, the identification code (8) corresponds to a world-wide unique identification code attached to the personal computer (11). In the case that the identification code (8) is provided by the personal computer (11) to the computer system (6), the identification code (8) can be displayed on the screen so that it can be used by the customer while using the second connection (13). The customer can also be instructed to wait a short time before initiating the second connection. This is because time is needed for the computer system (6) to process the received data, sent by the customer.

00020. Establishing a second connection (13) connects the customer to the order-handling system (7). The customer will be asked by an order-handling system to enter the identification code (8). If the access device (12) is a pulse tone telephone, it is possible to connect the customer to a telephone-operator who can collect the required information from the customer. After having entered the identification code (8), the customer enters the reference number digits (4) supplementary to the digits in the subset (3) of the reference number, the latter being already available in the storage means (5) at the remote location (10). The second connection (13) is associated with the purchase

order, and the complete reference number can be
determined by concatenating the digits in the
subset (3) of the reference number and the
supplementary digits (4) that are entered via the
5 second connection (13).

00021. If the identification code (8) provided to
the customer is unique, there are no additional
measures needed to solve ambiguousness. In this case,
10 the procedure for receiving data by the order-handling
system (7) or a telephone-operator via the second
connection (13) can be relatively simple.